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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,484	10/23/2003	Mac Stevens	P156C1-US	2568
50/905 7590 10/14/2009 N. KENNETH BURRASTON KIRTON & MCCONKIE P.O. BOX 45120 SALT LAKE CITY, UT 84145-0120				
EXAMINER				
GEDRESILASSIE, KIBROM K				
ART UNIT		PAPER NUMBER		
2128				
NOTIFICATION DATE		DELIVERY MODE		
10/14/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/693,484

**Applicant(s)**

STEVENS ET AL.

**Examiner**

KIBROM GEBRESILASSIE

**Art Unit**

2128

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,3,6-11,18,21,44,48 and 55-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,6-11,18,21,44,48 and 55-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 03/18/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This communication is responsive to amended application filed on 06/11/2009.
2. Claims 2, 3, 6-11, 18, 21, 44, 48, and 55-58 are presented for examination.

### *Response to Arguments*

3. Applicants argument relating to 112, second paragraph, is considered and therefore the rejection is withdrawn.
4. The double patenting rejection is maintained.
5. Applicant's argument relating to art rejection is not persuasive.
  - a. Applicants argue Kikuchi et al does not disclose "locating a particular number of nodes between a pair of said obstacles, said particular number corresponding to a maximum number of traces that can passes between said obstacle, each of said nodes positioned between said pair of said obstacles representing a possible location of one of said traces that can pass between said obstacles"

Examiner respectfully disagrees. As claimed limitation indicated, the node is corresponding to the number of traces. Therefore, if there is a trace, then it is inherent to have a node or vise versa. Therefore, the reference clearly discloses calculating the routing zone width which is a bus of the width of the route (i.e. trace) and the width of necessary gaps above and below the route (See: Col. 10 lines 1-10). Further, the reference defines the routing zone has a width equal to a sum of the width of a route or routes in the routing zone and a necessary gap (See: abstract). If the sum of the width of a route and a necessary gap are

calculated, then it is obvious to one of ordinary skill in the art to know the number of traces that pass through the obstacles.

b. Applicants argue, Kikuchi et al does not disclose "means for applying force to ones of said nodes, wherein a magnitude of one of said forces applied to one of said nodes is proportional to proximity of said one of said nodes to one of said obstacles" or "means for moving within said proposed physical layout each of said ones of said nodes in accordance with said force applied said one of said nodes".

Examiner respectfully disagrees. Kikuchi et al discloses "calculation is made of a limit of movement of the one node towards the other node in a moving direction with a routing zone interposed there between" (See: Abstract), which is inherent to the "applied force". It is well known if there is a movement, there is an applied force. Without having an applied force, then it is impossible to move one node toward the other nodes. Therefore, the applied force of nodes of the claimed invention is inherent to the movement of one node towards the other node in the moving direction of the prior art.

#### ***Priority***

6. Acknowledgment is made of applicant's claim for benefit of the filing date of a continuation of the prior application Serial No. 09/938, 789, filed August 21, 2001.

#### ***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2 and 18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, and 12 of U.S. Patent No. 6,678,876. Although the conflicting claims are not identical, they are not patentably

distinct from each other because all claims are directed to creating an initial array of nodes within a routing space, adjusting initial array of nodes, and selecting a path through adjusted array of nodes.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 2, 3, 6-11, 18, 21, 44, 48, and 55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Publication No. 2001/0038612 issued to Vaughn et al in view of US Patent No. 6, 385, 758 issued to Kikuchi et al.

- c. As per Claim 1, Canceled.
- d. As per claim 2, Vaughn et al discloses an apparatus comprising computer hardware for use in generating paths for electrically conductive traces within a routing space comprising:

means for receiving computer readable information representing a proposed physical layout of a routing space of an electronics system including locations of a first electronic component, a second electronic component, and obstacles within said proposed physical layout (such as... *input 102 represents the data entered by a user describing the circuit to be routed. This data... includes a placement diagram,...a placement diagram generally consists of a drawing that shows the location and physical outlines of all of the components...*; See: par [0059]-[0060]);

means for creating an initial array of nodes within the proposed physical layout (such as ...*the analysis engine defines intermediate or target nodes which are virtual nodes assigned by the analysis engine in order to specify the location of the connection ...*; See: Col. 8 par [0112]);

means for adjusting within said proposed physical layout said initial array of nodes (such as... *intermediate or target nodes which are virtual nodes assigned...such a virtual nodes or targets could be used to specify the location of a connection...a virtual node or target may be temporary and it may be movable during a routing analysis...(See: [0112] lines 5-14)...the routing engine offsets or jogs the segment path by relocating the start node to either side of the intended heading in order to branch around the obstacle...*; See: Col. 18 par [0171]),

means for creating a computer generated representation of a trace within said proposed physical layout of said routing space that connects the first

electronic component to the second electronic component and passes between said pair of obstacles by selecting a path through said adjusted array of nodes, said trace comprising said path (such as...*creating a pattern of traces on a routing surface from input data from connections in accordance with the trace creating algorithm...*; See: Abstract).

Vaughn et al discloses means for adjusting (i.e. relocating). However, Vaughn et al fails expressly to disclose locating a particular number of nodes between a pair of said obstacles, said particular number corresponding to a maximum number of traces that can pass between said obstacles, each of said nodes positioned between said pair of said obstacles representing a possible location of one of said traces that can pass between said obstacles.

Kikuchi et al discloses locating a particular number of nodes between a pair of said obstacles, said particular number corresponding to a maximum number of traces that can pass between said obstacles, each of said nodes positioned between said pair of said obstacles representing a possible location of one of said traces that can pass between said obstacles (such as...*calculating the routing zone width which is a bus of the width of the route (i.e. trace) and the width of necessary gaps above and below the route...*See: Col. 10 lines 1-10).

It would have been obvious to one of ordinary skill in the art to combine the teaching of Kikuchi et al with the teachings of Vaughn et al because both references drawn to automatic routing system for circuit layout. The motivation to



do so would be to reserve a sufficient space between the routes or wires so as to suppress occurrence of crosstalk therebetween (Kikuchi et al).

e. As per Claim 3, Vaughn et al discloses the apparatus system of claim 2, wherein said means for adjusting comprises, determining means for determining said particular number of paths traces that may pass between said pair of obstacles (such as *...the zone quanta concept enables both the analysis and the actual routing to take place in a defined zone quanta of limited area, wherein the number of routing path segments to be processed and the number of obstacles to routing the path segments are reduced...*; See: Col. 16 par [00157] lines 8-13).

f. As per Claims 4 and 5, Canceled.

g. As per Claim 6, Vaughn et al discloses the apparatus system of claim 2, wherein said means for adjusting locates said particular number of nodes along a line segment between said pair of obstacles (such as *...the zone quanta concept enables both the analysis and the actual routing to take place in a defined zone quanta of limited area, wherein the number of routing path segments to be processed and the number of obstacles to routing the path segments are reduced...*; See: Col. 16 par [00157] lines 8-13).

h. As per Claim 7, Vaughn et al discloses the apparatus system of claim 6, wherein said line segment is a shortest line segment between said pair of obstacles (See: Col. 6 par [0104]).

i. As per Claim 8, Vaughn et al discloses the apparatus system of claim 2, wherein said means for adjusting adjusts a location of each of at least one of said

nodes in accordance with a proximity of said node to an object in said routing space (such as...*intermediate or target nodes which are virtual nodes assigned...such a virtual nodes or targets could be used to specify the location of a connection...a virtual node or target may be temporary and it may be movable during a routing analysis...*; See: [0112] lines 5-14).

j. As per Claim 9, Vaughn et al discloses the apparatus system of claim 2 further comprising means for linking said adjusted initial array of nodes (See: Fig. 6).

k. As per Claim 10, Vaughn et al discloses the apparatus system of claim 9, wherein said means for linking creates a link between each node in said array and nodes within a predetermined proximity of said each node without crossing any of said links (See: Fig. 5 and Fig. 6).

l. As per Claim 11, Vaughn et al discloses the apparatus system of claim 10, wherein said path traverses ones of said links (See: [0163] lines 10-15).

m. As per Claims 12-17, Canceled.

n. As per Claim 18, Vaughn et al discloses an apparatus comprising computer hardware for use in generating paths for electrically conductive traces within a routing space comprising:

means for receiving information representing a proposed physical layout of a routing space of an electronics system including locations of obstacles within said proposed physical layout (such as... *input 102 represents the data entered by a user describing the circuit to be routed. This data... includes a placement*

*diagram,...a placement diagram generally consists of a drawing that shows the location and physical outlines of all of the components..; See: par [0059]-[0060]);*

means for creating an initial array of nodes within said proposed physical layout of said routing space (such as *...the analysis engine defines intermediate or target nodes which are virtual nodes assigned by the analysis engine in order to specify the location of the connection ...; See: Col. 8 par [0112]);*

means for creating a computer generated representation of a trace within said proposed physical layout of said routing space by selecting a path through said adjusted array of nodes said trace comprising said path (such as...*creating a pattern of traces on a routing surface from input data from connections in accordance with the trace creating algorithm...; See: Abstract).*

Vaughn et al fails expressly to disclose the limitation of, means for applying forces to ones of said nodes, wherein a magnitude of one of said forces applied to one of said nodes is proportional to proximity of said one of said nodes to one of said obstacles; means for moving within said proposed physical layout each of said ones of said nodes in accordance with said force applied to said one of said nodes.

Kikuchi et al discloses means for applying forces to ones of said nodes, wherein a magnitude of one of said forces applied to one of said nodes is proportional to proximity of said one of said nodes to one of said obstacles (such as...*Calculation is made of the limit movable distance within which one node is movable towards the other node in a moving direction via the routing zone*

*including the routes and the necessary gap interposed therebetween...; See: Col. 5 lines 26-32; Fig. 8); means for moving within said proposed physical layout each of said ones of said nodes in accordance with said force applied to said one of said nodes (such as...movable distance within which one node is movable towards the other node....; See: Col. 5 lines 26-32; Fig. 8).*

It would have been obvious to one of ordinary skill in the art to combine the teaching of Kikuchi et al with the teachings of Vaughn et al because both references drawn to automatic routing system for circuit layout. The motivation to do so would be to reserve a sufficient space between the routes or wires so as to suppress occurrence of crosstalk therebetween (Kikuchi et al).

o. As per Claims 19, and 20, Canceled.

p. As per Claim 21, Kikuchi et al discloses the apparatus system of claim 18, wherein said means for applying a plurality of forces to one of said nodes, wherein a magnitude of each of said plurality of forces corresponds to a proximity of said node to one of said plurality of obstacles (such as...*Calculation is made of the limit movable distance within which one node is movable towards the other node in a moving direction via the routing zone including the routes and the necessary gap interposed therebetween...; See: Col. 5 lines 26-32; Fig. 8); and*

said means for moving moves one of said nodes in accordance with a vector sum of said plurality of forces applied to said one of said nodes (such as...*movable distance within which one node is movable towards the other node....; See: Col. 5 lines 26-32; Fig. 8).*

- q. As per Claims 22-43, Canceled.
- r. As per Claim 44, Vaughn et al discloses the apparatus of claim 2, wherein said computer generated representation of said trace is stored within said system apparatus (such as *system database 106*).
- s. As per Claims 45-47, canceled.
- t. As per Claim 48, the instant claims recite substantially same limitation as the above rejected claim 44, and therefore rejected under the same rationale.
- u. As per Claims 49-54, Canceled.
- v. As per claim 55, Vaughn et al discloses the apparatus system of claim 2, wherein said means for creating an initial array of nodes creates the initial array of nodes in a honeycombed pattern (See: Fig. 10B #366).
- w. As per Claim 56, Vaughn et al discloses the apparatus system of claim 2, wherein said means for creating an initial array of nodes creates the initial array of nodes wherein a random location of at least one node is generated (such as...a virtual node or target may be temporary and it may be movable during a routing analysis...; See: [0112] lines 5-14).
- x. As per Claim 57, the instant claims recite substantially same limitation as the above rejected claim 55, and therefore rejected under the same rationale.
- y. As per Claim 58, the instant claims recite substantially same limitation as the above rejected claim 56, and therefore rejected under the same rationale.
- z. As per Claims 59-63, Canceled.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIBROM GEBRESILASSIE whose telephone number is (571)272-8571. The examiner can normally be reached on Monday-Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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